

REMARKS

Reconsideration and withdrawal of the rejections of the claimed invention is respectfully requested in view of the amendments, remarks and enclosures herewith, which place the application in condition for allowance.

I. STATUS OF CLAIMS AND FORMAL MATTERS

Claims 1, 2 and 4-19 are now pending in this application. Claim 1 has been amended to incorporate the aluminum precursors of Examples 1, 9 and 10 in the specification and has incorporated the limitation of claim 3 (which has been cancelled). Claims 2 and 11-15 refer to various embodiment of Examples 1, 9 and 10. New claims 16-18 are method claims which also refer to various embodiments of Examples 1, 9 and 10. Support for the limitation of claim 19 can be found, e.g. on page 17, lines 22-26 of the specification. No new matter has been added by this amendment.

It is submitted that the claims, herewith and as originally presented, are patentably distinct over the prior art cited in the Office Action, and that these claims were in full compliance with the requirements of 35 U.S.C. § 112. The amendments of the claims, as presented herein, are not made for purposes of patentability within the meaning of 35 U.S.C. §§§§ 101, 102, 103 or 112. Rather, these amendments and additions are made simply for clarification and to round out the scope of protection to which Applicants are entitled.

II. THE 35 U.S.C. 102(b) REJECTION HAS BEEN OVERCOME

Claims 1-3 and 10-13 were rejected as allegedly being anticipated by Sato et al. (U.S. Patent No. 4,791,084 - "Sato"). The applicants request reconsideration of this rejection for the following reasons.

In order to advance prosecution, the scope of claim 1 has been amended to indicate specific combinations of aluminum oxide precursors and phosphorus sources which are not disclosed by Sato. As such, the claims as amended do not meet the standards for establishing anticipation, i.e. that each element of the applicants' invention is described in the prior art and that the identical invention must be shown in as complete detail as is contained in the...claim. (see MPEP 2131).

The applicants' claims as amended now include specific combinations of aluminum oxide and phosphorus sources in addition to the Al/P ratio of 10 to 100. However, Sato reference does not specifically describe these combinations within the reference; only broad

isolated teachings. Moreover, the applicants' catalyst compounds require that they be useful for the hydrolytic decomposition of exhausted perfluoro-compounds by using water; there is no indication that the catalysts of Sato have this property.

If the argument with regard to Sato was based on inherency because of the broad overlap of ranges and components, one of ordinary skill in the art would not have been directed toward obtaining the applicants' claimed catalyst (especially as amended) merely through routine experimentation within the Saito reference, especially when the aluminum oxides of Saito represented only a single component for a catalyst composition that would be effective for a different invention, i.e., the cracking of hydrocarbons.

While the rejection appeared to focus on claim 1, the applicants also present that the dependent claims are even further removed from Sato (see e.g. claims 10, 12, 14, 15 and 19).

For these reasons, the aluminum oxide catalysts as claimed are not anticipated by Saito.

III. THE 35 U.S.C. 103(a) REJECTION HAS BEEN OVERCOME

Claims 1 and 4-9 were rejected as allegedly being obvious by Rossin (U.S. Patent No. 6,509,511) in view of Sato et al. (U.S. Patent No. 4,791,084 - "Sato"). The applicants request reconsideration of this rejection for the following reasons.¹

In order to establish a *prima facie* case of obviousness, all of the claimed limitations must be taught and there must be a likelihood of success for making the modifications to the prior art reference. However, Rossin in view of Sato does not meet this standard.

The Rossin reference was used in the previous office action but was used in combination with Chao (U.S. Patent 4,629,717) instead of Sato. As such the applicants' analysis of Rossin from their previous response is considered to be repeated here (for the Examiner's benefit, this response is being provided in footnote 2).²

¹ As claims 4-9 were directed toward method of catalytic decomposition of exhausted perfluoro-compounds, it is presumed that the inclusion of claim 1 was based on the presumption that this claim was anticipated by Saito. As presented above, Saito does not anticipate the applicants claimed aluminum oxide catalyst and there is also no basis for the obviousness of claim 1 based on Sato.

² In discussing the Rossin reference, the only difference acknowledged is the molar ratio described in the applicants' claim 1.

It is presumed that Chao is being relied upon for its referral of a phosphorus to aluminum ratio of 1:1 to 1:100 for combination with Rossin. However, as noted above, the Chao reference does not refer to a ratio for phosphorus loaded onto the *surface* of the aluminum oxide

Such that it could be argued that it would have been routine to optimize conditions or try the range of Chao, it is noted that MPEP 2144.05 section II (Optimization of Ranges) states that "[a] particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges

However, Sato used in combination with Rossin also does not render the applicants' claimed invention (which for claims 4-9 are directed toward a method of catalytic decomposition of exhausted perfluoro-compounds) to be obvious.

While Rossin is directed toward a process for converting perfluoroalkanes, Sato is directed toward using their catalytic compositions for the catalytic cracking of hydrocarbons (see e.g., Abstract, Background of the Invention and Claims of Sato) which is clearly different than the invention of Rossin.

As the applicants assert that Sato does not anticipate or render the applicants claimed aluminum oxide catalysts to be obvious, the combination of Rossin and Sato still fails to teach all of the applicants' claimed elements of their invention and as such *prima facie* obviousness has not been established.

Even if one were to accept the position that Sato taught the aluminum oxide compounds which are loaded with phosphorus as in the applicants invention, these compounds as described by Sato did not even show activity alone for the cracking of hydrocarbons, i.e. the aluminum oxide compounds described in Sato were used as part of a catalytic composition which comprised of at least three components: (1) a porous inorganic oxide matrix; (2) particles of crystalline aluminosilicate zeolite and (3) aluminum particles having a particle diameter of from 15 to 60 μm and impregnated with a phosphorus component. There was no evidence supporting the likelihood of success than any of these three components alone would be effective in

of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977).” Neither Chao or Rossin makes the recognition for use of these ranges with aluminum oxide based catalysts.

In addition, the applicants have provided two bases for secondary consideration which direct one of ordinary skill in the art against a presumption of obviousness.

First, the claimed ratio of 10-100:1 was not specifically disclosed by either Rossin or Chao nor did would they have taught the skilled artisan the unexpected results of forming catalyst with this aluminum (Al) to phosphorus (P) ratio.

If the surface of aluminum oxide is loaded with a phosphorus component such that the Al/P ratio is less than 10, the acidity loss of the aluminum oxide could be minimized due to the low loading of P, but the content of P was insufficient to stabilize the aluminum oxide phase and to prevent accumulation of fluoride in the catalyst which leads to deactivation of the catalyst. On the other hand, if the Al/P ratio was in excess of 100, while there would be improvement in the stability of the catalyst due to the high loading of P, there was also a decrease in the number of acidic sites which leads to a decrease in the hydrolysis of polyfluorocarbons (see paragraph [0022] of the specification). Neither of these unexpected results were recognized by Rossin or Chao.

Second, the applicants provided evidence in the specification which shows unexpected results, i.e. the comparative example (see paragraph [0058]). This example is actually closer than Rossin for comparative purposes as the comparative example specifically uses phosphorus whereas Rossin only suggests Rossin as one of many stabilizing agents (and actually leads one of ordinary skill in the art toward the use of zirconium oxide or cobalt - see col. 6, lines 36-37 of Rossin). In addition, the comparative example uses aluminum nitrate which is also a preferred alumina source of Rossin - see col. 3, lines 49-53.

The comparative example shows that conversion of CF_4 was only 3% when using the comparative example, whereas conversion was 100% using the catalyst of the applicants invention. This is clearly an unexpectedly improved result.

Therefore, since the combination of Rossin and Chao does not teach all of the limitations of the applicants' claimed invention and there is evidence of unexpected results, Rossin and Chao does not establish *prima facie* obviousness.

cracking hydrocarbons and the likelihood of success for selecting a specific component from Sato for combination with Rossin becomes even more remote when it is being applied to a different invention, i.e. catalytic decomposition of exhausted perfluoro-compounds.

Therefore, the combination of Rossin and Sato also fails to establish *prima facie* obviousness as there is no reason to combine the selected teachings to arrive at the applicants' claimed method of catalytic decomposition of exhausted perfluoro-compounds nor was there any likelihood of success for making the specific combination based on their respective teachings

CONCLUSION

In view of the remarks and amendments herewith, the application is believed to be in condition for allowance. Favorable reconsideration of the application and prompt issuance of a Notice of Allowance are earnestly solicited. The undersigned looks forward to hearing favorably from the Examiner at an early date, and, the Examiner is invited to telephonically contact the undersigned to advance prosecution. The Commission is authorized to charge any fee occasioned by this paper, or credit any overpayment of such fees, to Deposit Account No. 50-0320.

Respectfully submitted,
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